PECULIARITIES OF FERTILIZATION PROCESS IN THE SPONGE *LEUCOSOLENIA COMPLICATA* MONTAGU (CALCISPONGIAE: CALCARONEA) FROM THE BARENTS SEA. *Memoirs of the Queensland Museum 44: 44. 1999:-* The fertilization process in the Barents Sea sponge *Leucosolenia complicata* Mont. (Calcispongiae: Calcaronea) was studied on the ultrastructural level and light microscopy level with histochemical methods being applied (tests for the total content of proteins, lipids, mucopolysaccharides, nucleic acids were carried out). As with all other Calcispongiae (Hexactinellida), fertilisation is conducted with the special carrier cell. At present, carrier-cell fertilisation is found in a series of species, mainly in sycon- and leucon-structured Calcaronea. *L. complicata* has an anatomical organisation of the ascon type and specific fertilisation processes in *L. complicata* might be due to its sperm's unique organisation.

The mature spermatozoon has neither acrosome nor flagellum, but is just a spherical cell 4.8μm in diameter, occupied mainly with the nucleus (d=4.6nm). In *L. complicata* spermiogenesis takes place in choanocytes where the protein capsule around the sperm nucleus is synthesised. During the massive sperm release, any cell from the nurse cells complex, can seize a sperm and transform into a sperm-carrying cell *in situ*. The transformation of a seized sperm into the spermiocyst is accompanied with rapid isolation of the sperm's nucleus from its protein capsule. These processes are correlated with protein-dying tests and might be a result of either protein accumulation or structural transformation of the proteins that comprise the capsule and nuclear chromatin. The spermiocyst formation goes along with the hypertrophic changes of the carrier cell, i.e. its diameter increases from 8.8-19.4μm and the nurse-cells increase in their size (from 8.8-11μm diameter), evident from transmission electron micrographs.

The fertilisation process begins with the protein capsule penetrating the oocyte and gradually resolving in its ooplasm. The extra swelling of the sperm nucleus within the carrier cell coincides with this process. The sperm nucleus penetrates into the oocyte's cytoplasm and the maturation divisions in the egg proceed. They take place in the egg's animal part, turned towards the choanoderm. Both meiotic divisions from metaphase1 to telophase2 follow. The chromosomes' arrangement within the metaphasal plates during both maturation divisions appear to be most characteristic of the *L. complicata* oocytes' meiosis: the chromosomes arrange themselves annulus-like (ring-like). During either the first or the second maturation divisions the annulus-like metaphasal plates turn 90° around and only then the chromosomes begin to move towards the maturation spindle poles. The polar bodies are separated under the choanoderm. The completion of the oocyte's maturation divisions coincide with the beginning of the sperm-nucleus's transformation into the male pronucleus. Therefore the processes of male and female pronuclei formation is concurrent.

The sperm nucleus begins transforming into the male pronucleus with its own nuclear membrane destruction, male chromatin swells and loosens, and the building of the pronucleus membrane follows. After the maturation divisions are completed, the chromosomes are condensed into a tight spherical chromatin mass, which then gradually loosens and is transformed into a chromatin net. The female-pronucleus membrane is then formed. Definitive pronuclei are similar in their size and show up as large (d=22nm) bubble-like nuclei filled with finely-granulated chromatin net. In *L. complieata,* pronuclei do not fuse together. As a rule, two groups of chromosomes are formed in the zygote, they unite into one and arrange into a metaphasal plate of the first cleavage division. ❐ *Porifera, Calcispongiae, fertilisation, spermatozoon, carrier cell, spermiocyst, oocyte, meiosis, zygote.*

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THE RELATIONSHIP OF SILICATE LEVELS TO THE SHALLOW WATER DISTRIBUTION OF HEXACTINELLIDS IN BRITISH COLUMBIA. *Memoirs of the Queensland Museum 44: 44. 1999:-* The boot sponge, *Rhabdocalyptus dawsoni*, occurs at depths as shallow as 10m in the Strait of Georgia, British Columbia. The cloud sponge, *Aphroeallistes vastus*, typically occurs in slightly deeper water but has been found as shallow as 5m in Johnstone Strait, British Columbia. These species also form bioherms several meters thick in some localities. Initial surveys of the literature indicate that shallow water silicate levels in regions of British Columbia are high compared to levels in other shallow marine waters. Areas of the Antarctic are an exception and hexactinellids also occur here in shallow water. Hexactinellids are absent in habitats which might be expected to support populations, such as Norwegian fjords, but where silicate levels are low. The recently described shallow water occurrence of hexactinellids in the Mediterranean may be an exception. Additional input from anecdotal or unpublished data from the community of sponge researchers may help support or refute a relationship between shallow water occurrence of hexactinellid populations and high levels of silicates. ❐ *Porifera, hexactinellid, silicates, British Columbia, shallow water.*

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